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ABSTRACT

The final chapter of a seven-section report that examined the assessment of occupational competence, this chapter explores the key patterns and commonalities that have emerged from the study of occupational competency assessment. The chapter begins with a synthesis of the state of the art of competency definition and measurement under four topic headings: definition of competence (what is measured), derivations of competence variables (how hypothesized competencies are identified), the measurement of competence, and the validity of competencies defined. The synthesis is followed by an in-depth discussion of the themes which emerge from the points of view of the various components of the human resource development system: the consumer, the educational system, licensing and certification, employers, the federal government, and the research and development community. The third major portion of the chapter examines key countervailing forces which present problems for advancing the practice of defining and assessing competence. The concluding section discusses what the actors in the human resource development system can do to improve the practice of competence assessment through economic incentives, law and regulation, dissemination, government practice, and program evaluation. (Other sections of the report are available separately--see note. The first is an overview; the last is a synthesis of issues.) (LRA)

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THE ASSESSMENT OF OCCUPATIONAL COMPETENCE

6. SUMMARY: A SYNTHESIS OF ISSUES

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I. INTRODUCTION

Employers, educators, licensing and certifying bodies and the courts have all had quite a lot to say about the assessment of occupational competence. Because of needs unique to these individual arenas and the history of each in the development and advocacy of assessment practices, the preceding chapters have presented a wealth of information that is not easily comparable. The purpose of this final chapter is not to recapitulate the main points of these chapters, but rather to explore the key patterns and commonalities that have emerged from our study. By so doing, it is our aim to examine the state of practice in defining and assessing competence in terms of what must be done to improve the functioning of what we will refer to as the human resource development system.

Each of the preceding chapters has a special focus, determined largely by those parties or movements that have had the greatest effect on the way competency definition and assessment is carried out. Though the student is the "consumer" of human resource development, the employer is the "end user" of the products of the human resource development system, and employee selection is the most visible manifestation of competence assessment in organizations. The assessment center becomes a setting for a different kind of employee evaluation having to do with predicting employee potential and identifying development needs. Just as employers often use assessment

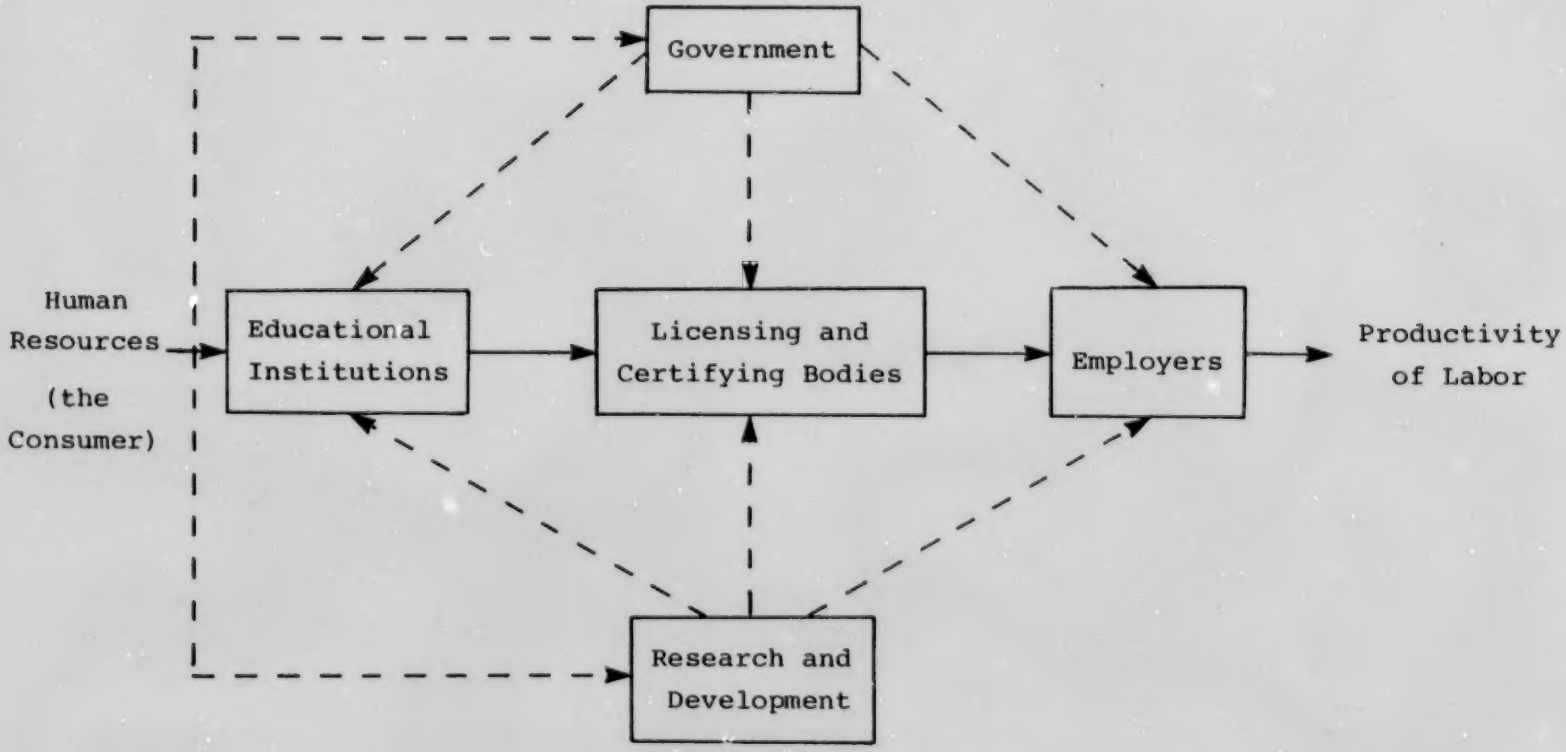
centers in conjunction with training programs, colleges are beginning to consider their utility. Licensing and certifying bodies are openly concerned with maintaining minimum standards of performance in many service groups and professions, and licenses and certificates are justified on the basis of certain tests of knowledge and skills. And meanwhile the federal government, through laws, overseeing bodies such as the Equal Employment Opportunity Commission (EEOC), and especially through the courts, has taken an active interest in equity issues regarding the practice of assessment.

Then there are educational institutions, charged with preparing students to fulfill roles in work and society. The use of assessments by educators is varied and incorporates practices reviewed in each of the other chapters. Finally, the research and development community, with its direct input into assessment technology itself, has a conceptual influence that presumably pervades the practice of competency measurement by all actors in the system and is the "silent partner" in each of the chapters.

A useful way to convey the relationships among these components is to think of them as parts of a human resource development chain. Figure 1 provides an illustration of some of the key links that connect the unprepared individual to his or her place in the community of the employed. Educational institutions, licensing and certifying bodies, and employers are gates to opportunity as well as the drivers in the system

FIGURE 1

The Human Resource Development System



that have the most direct impact on the individual in terms of competency assessment and development. The effect of the government's role on the individual passing through the system is indirect, though federal and state influence is felt directly by the gatekeepers to opportunity. The role of the research and development community is the least tangible of all as a force for change, many years of trial and application being required before new methods of competency measurement are assimilated into the system.

We will bear this conceptualization of the human resource development system in mind as we proceed to our conclusions. It has been introduced at the outset as a concept because, if there is one single overriding conclusion we have derived, it is that the human resource development system does not work effectively. Indeed, there is really no system at all. Only a small minority of employers have conducted job analyses and, consequently, most employers do not know what competencies are required for the jobs they have to offer, much less how to select for competence; licensing and certifying bodies claim to guarantee minimum standards, while their effect is more readily felt as a limiting of the labor supply; the unintended impact of the law has been to discourage innovation in the quest for fairness in employment practice; and educators, the group most responsible for developing competence in the labor supply, are the least aware of what knowledge, skills, and characteristics are needed in the workplace. What is more, each component in the system is functioning solely in accordance with its own

interests and not focusing on the outcome of the entire system, national productivity, which, in turn, will result in a better quality of life and increased opportunity.

The assessment of occupational competence is a piece of the puzzle that fits into each of the issues sketched above; it served as the focus of each of the chapters. The practice of competence assessment is directly affected by the lack of any systematic cooperation among the actors in the human resource development system. One of our assumptions in undertaking this study was that we would be able to make concrete suggestions about what aspects of assessment research to pursue. Yet, faced with the masses of data before us regarding the present state of practice and its historical roots, we are drawn inexorably to a second overall conclusion: advances in the art of competence assessment will have little measureable effect on the practice of assessment. As Chapter 1 on employment selection noted, though many advances in the state of the art of assessment have come and gone, assessment practice has basically remained unchanged during the last half century (cf. Freyd, 1923). There are many countervailing forces in operation that arrest progress, and their nature and impact will be examined later in this chapter.

With this as an introduction, we proceed to our summary of the key findings of this report. We begin with a synthesis of the state of the art in competency definition and measurement taken largely from the first three chapters on employee selection, certification, and assessment centers. This will be

a useful point of departure, since it provides examples of the best of current assessment practice. What then follows is an in-depth discussion of the themes which emerge from the points of view of the various actors in the system. Next we will illuminate the key countervailing forces which present problems for advancing the practice of defining and assessing competence. The concluding part of this chapter is a discussion of what the actors in the system can do to improve the state of practice in competence assessment, the goal being to improve productivity and the quality of life.

II. COMPETENCE ASSESSMENT: THE STATE OF THE ART IN COMPETENCY DEFINITION AND MEASUREMENT

Findings and recommendations concerning the state of the art of competence assessment can be summarized under four headings: (1) definition of competence (what is measured), (2) derivations of competence variables (how hypothesized competencies are identified), (3) the measurement of competence, and (4) validity of the competencies defined.

Definition of Competence

The preferred definition of competence is "a characteristic of an individual which underlies effective work performance." Competency characteristics by this definition can be classified into at least five categories including knowledge, skills, traits, self-schema, and motives. The notion that competence "underlies" performance suggests a causal relationship. This means that the competence "predicts" performance of a number of related behaviors or job tasks; e.g., the competency "achievement motivation" predicts many types of goal setting and entrepreneurial activities in different environments. "Criterion referenced" means that the competence predicts some known standard or level of effective work performance; i.e., someone possessing the competence can actually perform some task component of a real job well. As will be covered under

our later discussion of validity of competence variables, this definition of competence means that, to be useful, a competency measure must demonstrate concurrent or predictive criterion validity.

General, Transferable vs. Specific, Context-Bound Competencies

Researchers observe that the definition of competence is context bound if based on a criterion sample of effective performers limited to one job at one point in time. Educators traditionally see their mission as teaching generic competencies relevant to life-long learning and accomplishment (e.g., "critical thinking") rather than only vocational competencies relevant to a particular job (e.g., clerical skills). Critics of competency-based approaches express concern that competency-based selection procedures will tend to focus on skills which are easily measured and validated (e.g., for human service workers, the ability to process paperwork, which is much easier to measure, rather than interpersonal sensitivity). In each instance, the issue is the criterion variable being used. If the proper criterion variable is chosen, like effectiveness in a broad family of jobs such as human service work, management or production work, it is more likely that generic, transferable competencies, such as interpersonal sensitivity or conceptual ability, will be identified, measured, validated, taught and used in selection.

Minimal vs. Optimal Criteria, or Competence vs. Excellence

Any criterion-based competency measure can be questioned on the basis of how its criterion "cutoff point" was set. Should it be at a "minimum or threshold competence," the bare minimum needed to perform a job? Or should it be set at "excellence," to reflect the performance of the best job incumbents? Again, choice of the appropriate criterion variable dictates the predictor variables. In public educational systems the criterion variable of choice is usually a normative policy decision, such as the cutoff point on a minimum competency test required to receive a high school diploma. For employers, the appropriate cutoff level should be related to the measurable level of job performance which justifies the cost of labor. For educators, it should be related to that performance level needed to survive, or function at an acceptable level, in employment.

In any case, whether the choice of a cutoff point is closer to minimum competence or whether it is closer to optimal levels, it should be related to some measurable criterion of employment performance. Most current applications, however, fall short of this ideal.

The Derivation of Competence Variables

Three approaches to deriving competence variables can be distinguished (Dunnette, 1966): (1) "armchair theoretic"; (2) factor analytic; and (3) empirical.

1. In "armchair theoretic" approaches, one or more experts or expert panels (e.g., academics, job incumbents, senior persons in an organization, etc., who "know" what a liberally educated student, salesman, engineer or counselor "should know" or be able to do define the competencies required for a given job or level of academic attainment. These hypothesized competencies are then cultivated and assessed. This "armchair theoretic" approach is widely used but is not recommended, because competence variables arrived at in this manner show little validity in predicting job performance.
2. In factor analytic approaches, which include job task analysis, the components of the job or actual behaviors of job incumbents are described, correlated and factor analyzed to yield basic dimensions of behavior used to define the competencies required by the job. If a criterion level of performance is specified, job task analysis approaches demonstrate limited predictive validity because they essentially describe the job, not characteristics of people who do the job well. Such approaches, however, may often be useful in setting minimum knowledge and skill requirements of jobs. They are much less useful in describing competencies required for outstanding performance.
3. In empirical approaches, competence variables are identified by observing and describing the differences in behaviors of individuals from different criterion

groups (e.g., high and low performing job incumbents). Competencies are defined as those variables which differentiate the performance of the criterion groups. The empirical approach to competence definition is recommended because it consistently demonstrates the greatest criterion-related validity.

The Measurement of Competence

Five distinct appoaches to measuring competence were identified and reviewed: tests (respondent and operant), ratings, work samples (including the assessment center), interviews, and biographical self reports (e.g, personal histories, job applications and resumes).

1. Tests. Several thousand tests have been used to measure different types of competence: general intelligence, personality characteristics, content knowledge, perceptual and motor skills. Tests may be divided into respondent and operant types. Respondent tests, such as "multiple choice" tests, present a variety of possible answers and require a test taker to recognize and choose the best response (e.g., identify the most effective argument from among four choices). Operant tests require a test taker to produce a behavior (e.g., to write an effective argument for a given position or an issue). Respondent tests tend to have greater reliability or internal response consistency than operant

tests (r's of .70-.90, vs. .60 to .70 for operant measures). Operant tests, however, have the potential to demonstrate greater validity in predicting job performance because they are more direct measures of what an individual can actually do, especially in situations where many alternative responses are appropriate. For example, there is a world of difference between recognizing an effective argument (respondent) and arguing effectively (operant). The knowledge of operant competency measures is not as widespread as that of respondent measures, however. The former are more difficult and expensive to score, but often provide benefits in selection, for example, that exceed those of respondent measures out of proportion to their greater complexity and cost.

2. Ratings. Individuals can be rated on their competency characteristics by their superiors, peers, subordinates, and other independent observers. Recent studies suggest that many forms of ratings, particularly peer ratings, demonstrate higher concurrent and predictive validity than do tests. Ratings may also be superior to other measures because they are based on observations of larger samples of operant behavior in real work environments.

3. Work samples and assessment centers. Individual competence may be assessed by measuring performance on simulated job tasks (e.g., speed in inserting pegs in

template holes to test physical assembly skills, or making an oral presentation and completing an in-basket exercise to test oral communication and administrative skills). Both work samples and assessment centers surpass in validity the majority of respondent, paper-and-pencil tests, though both are much more expensive to administer than tests. The effectiveness of work sample and assessment center methods is determined by how closely the exercises approximate the actual tasks required by the target jobs. A general finding seems to be that most assessment centers use too many competency variables (25 or more), when factor-analytic studies show that raters can distinguish only two or four dimensions at best, making ratings subject to a variety of confounding effects. Definitions of competency variables also tend to be loose and are rarely based on empirical studies of what predicts successful performance in specific jobs. In these cases, work samples and assessment center validities do not exceed those of standard personnel practices such as supervisor ratings.

4. Interviews. Structured and critical incident interviews, rigorously coded, can assess intellectual, motivational and interpersonal competence with reliability and validity comparable to that of operant tests. As with assessment center methods, the validity

of interviews as a competence assessment method depends on empirical definition of competence variables in sufficient detail to permit interview responses to be objectively coded. Interviews, however, also represented the worst of the practice in terms of reliability and validity when carried out in a nonstandardized, unstructured manner. The most common of all assessment devices, interviews are also prey to every source of error imaginable, especially at the point that attributions of competence are inferred from the interview data.

5. Biographical documents. Resumes, application forms, and personal histories can assess knowledge, skill and written communication competencies with very high reliability (r=.85-.95) when structured questions and objective coding systems are used. Criterion validities for biographical data documents are also high, as high as the best of any other assessment device. The high reliability of biographical data is to be expected because biographical data represent immutable, historical data. Validity is also high since, answered truthfully, personal histories provide an "operant" description of what a person has done in the past based on the widest possible sample of behavior: one's life. However, it remains unclear how prior access to opportunity, a key ingredient in biographical self-report,

weighs on fair selection practice. Also, biographical data, like the school diploma, are "proxy" measures for competence; though they are often taken to represent competency attainment, they do not tell us about the specific nature of the competencies supposedly attained. Thus, since biographical data are not actual competencies, nor can they be interpreted unequivocally in terms of underlying competencies, they may be nearly useless from an educational perspective.

The Validity of Competence Variables

Discussion of alternative definitions, derivations and measures of competence is inseparable from the issue of validity. Validity is broadly defined as the extent to which a competence variable or assessment instrument represents or measures what it claims to represent or measure. At least seven definitions or types of validity appear in the literature on competence:

- Face validity, the degree to which the variable or instrument appears to be measuring what it claims to measure.
- Content validity, the degree to which the variable or instrument adequately samples the domain of the ways in which a competency can be expressed.
- Construct validity, the degree to which the variable or measure provides data that correlates sufficiently well with other measures of the same competency.

- Instructional validity, the degree to which the variable or instrument measures what has been taught in a given educational curriculum.
- Concurrent validity, the degree to which the variable or instrument provides data that correlate with the present performance level of students or job incumbents.
- Predictive validity, the degree to which the variable or instrument provides data that correlate with later performance.

In addition, so-called "educational validity" is defined as the degree to which a competence variable can be developed through education or other experience. Trait competencies (e.g., height or weight for police recruits) are difficult to change, while knowledge and skill competencies are more easily acquired through educational experiences. Educational validity is relevant to educators (and employers) who must evaluate the extent to which the competencies can be developed as opposed to the extent to which one must select for the competencies that predict performance.

The EEOC guidelines appear to favor criterion-related validity (i.e., that measured competencies bear a demonstrated relationship to the successful performance of jobs), but concurrent or predictive validity is not necessarily what this implies. In practice, the guidelines deem acceptable the content validation of a job, or the systematic determination of the work and task requirements from which knowledge and skills are inferred; one does not have to actually demonstrate whether the tests of these knowledge and skills actually correlate with work performance. Given the relatively few employers who have

conducted formal job analyses, perhaps any systematic method of determining what competencies should be assessed (however theoretical and unvalidated in a concurrent or predictive sense) is better than no method at all.

The problem with content-analytic approaches to identifying competencies is not in their apparent reasonableness but in their applications to selection and licensing. For example, it might be determined that the tasks performed by a social service caseworker include looking up the telephone numbers of clients. What is typically done then is to devise a test of the ability to do this task, and to give credit for the quantity of telephone numbers correctly accessed during the time allowed by the test. Note, however, that the requirement of the job is simply the ability to look up telephone numbers accurately, while the test gives credit for the speed with which this is done. This example is typical of many selection and certifying situations where the competency that is measured (e.g., the speed with which a task is done) is different from that originally specified (e.g., the ability to do the task). In the absence of concurrent or predictive validation, we cannot be sure that a test labeled as measuring a specified capability actually measures anything of importance to a job.

The validity of a competency measure is dependent on that to which it is referenced; validity does not exist as a concept unto itself. The two aspects of validity which are concerns of the preceding chapters are meaning (what in fact is being measured) and utility (what is the practical consequence of

measurement). There is no single aspect of validity that is, of itself, sufficient as an indicator of the meaning of a measure. Measures which are face-valid or content-valid may not be related to any performance outcomes of importance. By the same token, a measure which is concurrently or predictively valid, such as biographical, personality, or interest inventories, may not be tests of "competency" (what the person can do). Construct validation comes closest to providing an indication of what a measure means in relation to other measures, but construct validation alone, in the absence of criterion-related validation, provides no indication of a measure's utility in selection, certification, or individual development. Clearly the more ways one can understand a competency and the way it is measured, the better. Nevertheless, given our definition of a competency as a characteristic of an individual which underlies performance, a measure which has meaning but no utility cannot be considered "competency-based."

Existing assessment technology allows practitioners to examine, in depth, the nature of "predictor variables," measures that are supposedly related to performance (though contrary to this label, predictor variables do not necessarily "predict" anything). However, relatively little is known about criterion variables, or the performance outcomes of interest to educators and employers. In complex jobs, like human service delivery, management, and scientific invention, where quantifiable criteria are difficult to obtain, the most common criteria are either "dimensions" of performance, such as "leadership ability"

and "communication skill," or supervisor ratings of overall performance in the job. The bulk of employment selection research, and almost all assessment center research, is based on these ratings, even though research has shown that supervisor ratings are among the least reliable or valid approximations of true job performance. They are not strongly related to hard outcome criteria (e.g., Lawler & Kane, 1978).

Thus, the search for meaningful criterion variables continues. Recent practice in this regard has included the use of "success" in school or training programs as a criterion, even though there may be no, or often negative, evidence to the effect that completion of specific education or training programs is correlated with job performance. Thus, while the EEOC guidelines appear to favor criterion-related validity (that tests of competence bear a demonstrated relationship to job performance), the courts, to date, have held that a measure predictive of training success is acceptable for use (in the Washington v. Davis decision, a test was found acceptable in that it correlated with success in the police training academy, although not with effective performance in the job of policeman).

Educational policy issues concerning the use of competency measures turn on the choice of predictor and criterion variables. At this juncture, little is known about the criterion side of the equation, and we therefore recommend that future research emphasis be placed on acquiring a greater understanding of the nature of the performance outcomes toward which policy may be directed.

Final Comments

Even the best of the assessment practice is limited. There is no single assessment device or combination of such devices that will measure the competency of an individual with 100% accuracy. The dearth of competency research with reference to specific, complex jobs is a limitation on the utility of any assessment strategy, and the inherent restrictions that assessment situations place on the demonstration of competencies further reduces predictive power. The best possible practice of competency assessment, accordingly, would include the identification of valid performance criteria which are important to the performance of the whole job (rather than only discrete tasks); an understanding of both the job and the individual who performs the job well, taken from many perspectives; and a heterogeneous assessment strategy, which takes into account a variety of measurement types and emphasizes tests of operant performance.

Today, even the best of practice suffers from inadequate outcome criteria, single-perspective job analysis, and restriction in range of responses in assessment. What is needed is a multi-method approach to identifying performance criteria, competencies, and competence assessment techniques. That is, the more ways one can learn about a job (including the often neglected practice of direct observation), measure the different kinds of outcomes obtained by doing the job well

(including "harder" data than supervisor ratings of performance), and assess component aspects of performing the job (including operant and other behavior-based measures as well as respondent, paper-and-pencil techniques), the better assessment practice will be.

III. THE HUMAN RESOURCE DEVELOPMENT SYSTEM

The previous section paints a positive picture of the future of competence assessment in terms of what is technically possible, an expression of the ideal state of affairs. The bad news is that there is little evidence to suggest that this future is near or even at all realistic. Much of the best of practice in competency definition, derivation, measurement and validation has been known and advocated for the last half-century, but the overall state of practice has not significantly improved. We are now in the position to direct our attention to some of the reasons employers, licensing and certifying bodies, and educators have been unable to adopt the best available practices.

Some of the reasons for this are easily obscured in an examination of the individual actors in the human resource development system. One necessary step in analyzing the usefulness of research findings and possible courses of action is to view findings and options from a systems perspective, realizing that the human resource development system is composed of many interacting and interdependent parts. Our plan for this section, therefore, is to discuss the interests, practice, and implications of practice for the individual actors in the human resource development system: the human resources themselves (the consumer), the educational institutions, licensing and certification bodies, and employers;

and, interacting with them, the government in its various roles and the research and development community.

The Consumer

Interests

Consumers are interested in clear job or career pay-offs for investments of time or money in education. Women and minorities are especially interested in improving their competitive position in the labor market through education and training. "Saleable skills," "marketable skills," "basic skills," "job relevance" and "competence" are all slogans for expressing these consumer concerns. Due in large part to the tight connection between education and work, consumers are interested in academic credit and credentials per se. Credits and degrees are also ascriptions that enhance one's self-image and prestige. However, economic conditions are deteriorating and a concern for cost-cutting has beset consumers. "Interest" in career pay-offs is for many people, perhaps, more appropriately deemed "anxiety" about the affordability of education and about one's chances in the world of work.

Practice

Several aspects of the consumer movement reflect the above interests. Although there has been little pressure on the part

of consumers to make postsecondary education more responsive to their needs, patterns of enrollments are shifting towards courses and programs that appear to hold greater promise of occupational relevance. Nontraditional programs, especially those tailored to the needs of working adults, are increasing in popularity.

Minimum-competency testing, the most recent manifestation of the accountability movement in education, reflects consumers' concerns with returns on educational investments in the form of functional literacy or learning that is relevant to life beyond the classroom. Also, in recent years, there has been a good deal of public consciousness-raising surrounding the role of tests as mediators of education and employment opportunities, with the institution of licensing--a gate to the world of work--receiving critical scrutiny.

New York State recently passed the nation's first "truth in testing" statute, and Congress has been exploring the feasibility of similar legislation at the national level. With respect to licensing, as discussed in Chapter 3, several states have passed "sunset" laws which challenge the necessity of licensure. Other states have added consumer representatives to licensing boards. Researchers, policy analysts and consumer advocates have also begun to sensitize state officials and the public to widespread methodological deficiencies in testing practices surrounding licensing and certification; and, as Chapter 5 on the courts demonstrates, the public is exercising

its legal rights through litigation that challenges tests used for licensing and employment purposes.

Implications

Needs of consumers for job-relevant skills and growing resentment of artificial barriers to education and employment opportunities suggests considerable public receptivity to instructional programs firmly grounded in the actual demands of practice, be it living well or doing well in the world of work, and assessments that can demonstrate concurrent or predictive validity with respect to job performance. Indeed, as discussed in Chapter 4 on education, the public has jumped on the "competency bandwagon." However, a clear danger suggested by this and by the shift of enrollments over the past decade to courses and programs that appear more occupationally relevant is that either they are not relevant, or they are relevant but trivial. A concern for protecting the public interest suggests a need for verification of the claims of competency-based education.

The Educational System

Interests

A central interest of the educational system, indeed its public mandate, is knowledge accumulation and transmittal, particularly knowledge about our culture and Western civilization. Traditions of academic freedom have grown up largely

in response to the desire to keep inquiry and instruction free from control of church, state, or other powerful elements in society. There is a strong interest in preserving whatever measure of academic freedom faculties have secured. Also, although many faculty might wish it were not so, they function to sort and certify people for further educational and employment opportunities. There are also the interests of the education system in maintaining enrollment and revenues, and of individual institutions in self-preservation. When the demographic bulge in the population was between the ages of 1 and 22, schools experienced a growth boom. As that population grew up and entered the work force and the youth population shrank, colleges faced declining enrollments. Some colleges curtailed services, some closed their doors, and others struck out in search of new markets, taking an interest in adult learners. "Lifelong learning," "recurrent education," "continuing education" and "community education," are some of the titles that encompass interests in serving new constituencies.

Practice

Practice relating to what is taught and what is measured in the education system is, in large part, shaped by traditions of academic freedom whereby faculty are given considerable control over program and course design and almost total control over the criteria for assessment of student performance. Few institutions have forged policies or procedures to handle complaints

about the validity of examinations or criteria for assigning grades. As discussed in Chapter 4 on competency-based education (CBE), our survey of CBE programs shows that few have gone any distance beyond the practices of more traditional programs, only a handful of CBE programs having developed specific criteria which faculty share in assessing student progress. Furthermore, in terms of what is taught and what is measured, even competency-based programs in education, with their mission of greater relevance to work, are largely ignorant of the characteristics of workers who perform competently in jobs. Few of these programs are grounded in any kind of systematic inquiry into aspects of competent performance.

While employers spent approximately $30 billion in 1972 and are projected to spend about $50 billion in 1980 on continuing education for their employees, a lion's share of these monies is being spent on hiring training staff or consultants as opposed to engaging postsecondary programs in the form of tuition supports or institutional grants. While some share of funds will always need to be spent by employers for highly specialized knowledge and skills relating to jobs, employers would prefer colleges and universities to have the capacity to meet a larger share of their needs for providing skill upgrading to employees (Kost, 1980). However, disciplinary and specialized knowledge are the central foci of educational institutions. Where skills are taught, they are usually technological in nature. In focusing on content, generic cognitive skills of

interest to employers may be acquired, but they are ordinarily not a focus of pedagogy or assessment. And the greatest gap between what schools teach and what employers need is in the area of interpersonal or social skills development. Many faculty, in fact, are not trained or assisted in developing teaching skills for knowledge delivery beyond traditional classroom-based training, and they are certainly not prepared to provide interpersonal skills development. They teach the way they were taught; they learned to focus on knowledge transmitted through the media of lectures and seminars, and their practice of teaching is usually with captive audiences of young people rather than life-experienced adults.

Implications

One key implication of current practices of the educational system is that traditional programs may continue to shrink and fold unless they are able to demonstrate that they are, indeed, relevant to the requirements of the workplace or unless they can change to become more relevant. Chapter 4 on CBE mentions problems of attempting to retrofit traditional programs to CBE models. Such changes are very expensive to implement, and while there are some success stories, thus far there are few. Difficulties in changing habits and attitudes of faculties are but a part of the change process. There are numerous organizational barriers to overcome, especially for programs in large

universities, including philosophical orientation, institutional history and tradition, accreditation, and getting top administration support. The experience of the CBE movement, outlined in Chapter 4, bodes ill for the adaptability of established academic institutions to the winds of change. How well different kinds of institutions will fare is uncertain. All that is certain is that significant shifts in market share are occurring in the educational system and are bound to continue should cost-cutting and increasing returns on investments in terms of productivity become dominant motives of consumers and employers.

Licensing and Certification

Interests

Licensing and certification practices are driven by competing demands. Their stated functions, those that primarily justify their existence, are governance, in maintaining standards and discipline, and the protection of the public's welfare. Our survey of recent practice, detailed in Chapter 3, suggests, however, that the degree to which these functions are carried out is, at best, uncertain. More certain are the secondary consequences of practices, including the control of the supply of workers, which affect the wages of the licensed and certified, the enhancement of the status of an occupation or profession, and the prestige of practitioners. There is more in licensing and certification that clearly benefits the professions and professionals, therefore, than there is that clearly benefits the consumer.

Practice

For the majority of licensing and certification requirements, tests of knowledge, rather than tests of the ability to use knowledge effectively, are the rule. This seems logical on its face, since without a certain amount of knowledge, one is doomed to failure no matter how skillful one might otherwise be. The large pools of applicants and the small budgets for test development and administration, however, practically require that little research go into the design of appropriate measures, and that those measures which are used be of the respondent, paper-and-pencil variety which can be inexpensively administered and scored. For those positions in which there are a small number of applicants, there may also be an oral examination. However, the criteria for performance in the oral examination are usually not specified, thorough training in interviewing skills is seldom provided, and reliability and validity are therefore at issue. Moreover, the standard for validation is "face validity"; in almost no cases have job analyses been conducted, and consequently content validity cannot be checked. It is highly questionable, therefore, whether the licensing system is tapping into the important knowledge or cognitive skills needed for occupational and professional competence.

Cutoff scores on the examinations are also at issue. At best, the determination of cutoff is normative, with scores above a certain percentile being acceptable. In many cases,

however, the norms are a function of the number of jobs or positions that are expected to be available, so that, in practice, the "top-scoring n" candidates will be licensed or certified. In only rare instances are cutoff scores determined by the levels of knowledge (or other characteristics) needed by an individual to perform minimally or acceptably at entry level.

With respect to governance, disciplinary action is largely "error oriented," rather than "benefit oriented": there usually has to be gross negligence and public exposure of a misdemeanor before a board will act to revoke a license or impose sanctions. Moreover, standards of performance and requirements for certification often vary from state to state, so a person who has had a license denied or revoked in one state can often pursue his or her business in another.

Largely in response to initiatives of consumer advocacy groups, some changes are occurring on the licensing scene in some states, such as sunset laws and the addition of consumer representatives to licensing boards. There are also challenges to the "once competent, always competent" hidden premise of the licensing system. Movement in the direction of relicensing reflects consumer concerns for improving the quality of services. For the most part, changes have dealt with the composition of licensing boards and whether qualifications should be periodically rechecked. Almost no energy has been turned toward bringing assessment practice closer to the competency-based ideal.

Implications

Growing suspicion of weaknesses in the licensing system's competence to certify competence and to govern occupations and professions undermines claims for leaving control of licensing (or certification) and governance largely in the hands of the occupations and professions. Yet, there is no evidence to indicate that any alternative groups could do better. In the long run, self-interest dictates that occupational and professional groups work toward developing realistic, valid criteria for selection and for performance reviews to adjudicate claims of negligence or incompetence.

Competency models that distinguish among optimal (related to superior performance) and minimal (related to average performance) competencies would be most useful here. In addition to providing a realistic picture of the ingredients of competence, cut-off scores could be established based on an understanding of average performers' capabilities. While standards will always fluctuate somewhat in response to the availability of talent, an understanding of minimal and optimal competencies and levels of performance would put the public in the driver's seat in making trade-offs.

Interests

Private sector employers are interested in improving productivity. Under the pressure of foreign competition, current interest is particularly acute. Advanced manufacturing technologies are being introduced and large investments are being made in human resource development in the private sector. The public sector, meanwhile, is straining under the public's belt-tightening manifest in the wave of cutbacks set off by current economic conditions. It remains to be seen whether a similar interest in productivity will touch public sector employers, leading to improved managerial practices and greater individual and organizational competence, or whether these things will remain low priorities, resulting in escalating decrements in the amounts of services that can be provided for a given cost.

Employers are also interested in complying with equal employment opportunity (EEO) regulations. Chapter 4 on employment selection and Chapter 5 on the courts bring the reader up to date on the shape these interests are taking.

Practice

In our discussion of the education system, we mentioned that employers are spending billions of dollars each year for upgrading the skills of their employees. In addition to

providing training and improving manufacturing technologies, some employers are also renovating selection systems and seeking ways to increase overall effectiveness through organizational analysis and planned interventions. But, as we found, many employers are backing away from improving selection practices due to a general lack of sophistication about the requirements of job analysis and competency validation and due to fear of the courts' rulings in cases involving selection tests. Many employers currently think it may be a lower-risk venture to make a suboptimal but "fair" selection and then train deficient new hires.

For most employers, the weakest link in the chain of activities that they are undertaking to increase productivity is the sparseness of the knowledge base about the dimensions of job competence from which they operate. Those who make investments in job analyses have at least some basis for determining the kinds of highly specialized knowledge and skills required; but there is a serious lack of knowledge about the generic requirements of jobs, which limits the utility of assessments and the efficacy of training programs. On the other hand, it is in some quarters within the employment sector that, ever so slowly but surely, research on competence is progressing and beginning to influence selection and training practices. This research delves beneath what individual tasks people perform in search of an understanding of what enables them to perform the whole job competently.

Implications

Because employers must comply with EEOC regulations, and because of their interests in increased productivity, competency-based assessment and training should have considerable appeal since, when rigorously undertaken, both ends can be served. The greatest challenges to increasing the adoption of state-of-the-art competency research models are: (1) to overcome the perception of the EEOC as a punitive agent which forces a retreat into "selection by the numbers," and (2) to identify appropriate criterion variables and then understand how individual performance relates to these criteria. Competition, even in the public sector, also represents a barrier to sharing new technologies, including those pertaining to human resource development. While pride in accomplishment leads to some disclosure, surmounting tendencies toward secrecy and noncooperation will require considerable creativity and determination.

The Federal Government

Many aspects of governmental operations impinge upon the state of practice in the assessment of occupational competence. We will discuss the federal government as regulator, adjudicator, employer, and stimulator of research and development activities.

The Government as Regulator: Interests

The interests of relevance to the subject of competence assessment have to do with equal opportunity and national productivity. There is an overarching mandate for all arms of the federal government to promote equality of opportunity through statutes, regulations, guidelines, executive orders and other mechanisms for influence and control. While special task forces and councils periodically reflect government interest in productivity, especially productivity in the private sector, there is no similar overarching mandate to promote productivity as a national goal to enlist the attention of regulatory bodies. This is perhaps because the mandates and goals of regulatory bodies often impede productivity gains.

The Government as Regulator: Practice

Practices of the federal government in issuing rules and regulations relevant to issues of competency assessment have been motivated primarily by issues of fairness in selection. Comparatively little emphasis, insofar as federal regulating bodies go, has been placed on soundness, a concept which incorporates practical values such as optimizing the match between people and jobs in the interests of improved productivity as well as legal obligations such as protecting individuals' Constitutional rights. On the other hand, Congress, in issuing Title VII of the Civil Rights Act of 1964 (the central focus of

Chapter 5 on the courts) clearly attempts to balance concerns for nondiscrimination in employment against needs of employers to select the most qualified employees.

Regulatory practices stemming from Title VII are very confusing to employers. No one is confident as to what the standards are and how to protect an organization from legal action under this legislation. As Chapters 1 and 2 discuss, there is a reactionary trend among employers away from the use of paper-and-pencil tests toward increased use of interviews and assessment center jury panel judgments. Employers, particularly large highly visible corporations, are especially concerned to "get their numbers up" and are busily engaged in producing paper trails documenting affirmative action activities and effects. Legally, where there is no adverse discriminatory effect, there is no Title VII issue or case. However, the proportions of female and minority workers at entry and at promotional levels are still very low, and there is no guarantee that current modes of selection other than tests will not be systematically challenged in the future.

The new interagency Uniform Guidelines are an attempt to consolidate federal rules and regulations on employment selection, but they are very similar to the superceded guidelines of the EEOC and do not add additional clarity to employers' attempts to gauge the legal merits or liabilities of current selection practices or to weigh attractive alternative practices intelligently. The pinches come as guidelines are interpreted by enforcing agencies and the courts, and second-guessing these bodies is almost impossible.

The Government as Regulator: Implications

The state of confusion among employers is not conducive to bringing practice in competence assessment more into line with the state of the art. It is, in fact, causing a retrogression to age-old, unrefined, unvalidated approaches whose vulnerabilities are no less than those of paper-and-pencil tests. If employers are to become more experimental in adopting state-of-the-art techniques to design more practical selection systems, they will require some kind of assurance that such efforts will be viewed as salutarily as are current affirmative action steps.

The Government as Adjudicator: Interests

The mandate of the courts is to render legal decisions commensurate with legal statutes. In doing so, judges must interpret the law, using whatever knowledge--including legislative history and precedents--they can garner, distilling and applying it to the case at hand. The interplay of social context and action are likewise taken into account both in rendering decisions and in prescribing remedies.

The Government as Adjudicator: Practice

Although much adjudication of complaints under Title VII of the Civil Rights Act of 1964 is handled out of court by the EEOC and various other offices of compliance in governmental

departments, access to this information is largely restricted. Chapter 5, therefore, details the practices of the federal courts, focusing on cases involving the use of tests and educational credentials in employment selection. The authors identify two phases in the emerging history of litigation in this area. The first phase, beginning with the landmark Griggs v. Duke Power Company decision in 1972, hit the courts and employers unprepared for the rigors of the EEOC's guidelines on employment selection. Both groups lacked sophistication about psychometric issues such as the relative merits of various methods for validating selection devices. As visibility of the EEOC's guidelines increased, court activities increased. Employers and judges became more sophisticated, as did consultants retained by employers to conduct job analyses and to validate tests. Despite the higher standard of the EEOC for criterion-referenced (concurrent or predictive) validity, the courts settled for face or content validity--the content validation standard being applied consistently where an employer had a history of blatant discrimination. Many tests were proscribed, as was the high school diploma requirement in most cases involving unskilled or semi-skilled blue-collar positions.

The second phase is one marked by considerable sophistication on the part of judges about psychometric practices and their implications for employers. This sophistication has reached beyond Title VII cases, affecting other types of decisions where psychometric practices were at issue, such as school district practices in assigning children to special

education classes on the basis of test scores and the denial of high school diplomas on the basis of cut-off scores on minimum-competency tests. The courts have become knowledgeable about the merits of criterion-referenced validation but have hesitated to apply this standard, believing, perhaps, that alternative measures that yield higher predictive validity are not available or could be developed only at extreme hardship to employers. Also, in the latest phases of court activity, many employers involved in litigation have done a lot of homework, hiring expert consultants and legal advisors to assist them. Unlike the early Title VII cases, practices are usually well-documented, with parties to the cases now conversant in psychometric intricacies--conversant enough to find apparent loopholes in the guidelines.

The Government as Administrator: Implications

Demonstrations of competence assessment techniques that have much stronger predictive validity than currently popular approaches, and cost-benefit studies that demonstrate affordability, contributions to productivity and less adverse effects for women and minorities, would clearly influence the opinions of judges and the activities of employers. As mentioned earlier in this section, identifying such successes and creating new ones would require creativity and determination. The courts themselves, by the very nature of their role, will be unlikely to advocate new approaches or to be an active agent in improving the state of the practice in competence assessment.

The Government as Employer: Interests

The government shares with all employers an interest in selecting competent personnel. Along with private sector employers, the government must comply with fair employment practice laws and the Uniform Guidelines. Unlike private sector employers, however, the government is not interested in profits but rather in preserving and extending public services. The absence of tangible outcome measures of profit and loss dulls the tendency to examine productivity of employees, although these interests do exist, receiving attention under other guises such as "accountability."

The Government as Employer: Practice

In keeping with the need for a qualified work force, the federal government spends millions of dollars each year on selection and training systems. The dominant methods used as a foundation for developing these systems are job task analysis, promoted by the Department of Labor, and job element analysis, developed by the Office of Personnel Management. With leadership from these offices, there has been considerable effort to disseminate these job analysis techniques nationally. Thus far, however, there has been less energy within government agencies to promote the development of improved competence assessment practices. The use of panels to generate content-knowledge items for multiple choice tests is the standard practice, and

the extent of cross-fertilization with empirical inquiry about the nature of jobs is limited. There are, however, pockets of research and development activity focused upon competency-based assessment and training, and, in some instances, upon predictive validation studies. The Office of Personnel Management's Research Division, for example, is attempting to improve its capacity to provide leadership in this area; and the Navy and the Army have invested in competency models which they are using as a basis for training programs that focus on generic abilities.

The Government as Employer: Implications

The federal government is not currently in a position to provide leadership to the private sector in the form of exemplary practices relating to assessment. Selection practices of federal, state and local governments are under fire in the courts. Moreover, there is some promotion of approaches to job analysis that are as yet unproven in terms of their value in identifying dimensions of competent performance which could, in turn, enlighten the search for sound assessments. Concurrent and predictive validation of tests to determine their ability to discriminate average from superior performers would provide baseline data against which to gauge the need for fresh approaches and against which to evaluate outcomes of experiments with new approaches and new measures of competence. The differential impact on women and minorities of current and

future approaches to assessment should also be tracked as an indicator of the merit of various ways of defining and measuring competence.

The Government as Sponsor of Research: Interests

The interests of the government as sponsor of external research and development are as diverse, uncoordinated and impermanent as the units in the federal structure responsible for allocating these resources.

The Government as Sponsor of Research: Practice

The federal agencies which have done most to promote research and development on competence are the Fund for the Improvement of Postsecondary Education (FIPSE), its funded projects representing the strongest strain of the CBE movement as noted in Chapter 4 on education, and the National Institute of Education (NIE), with its funding of six projects on competence, including the study that formed the basis for this report.

Interest in competency-based education and assessment has thus far been confined primarily to FIPSE and the Teaching and Learning Division of NIE. FIPSE has very limited funds to invest in research, and must justify such investments as necessary for the success of innovations it sponsors and as research that is highly unlikely to be undertaken through other

sponsorship. The Productivity and Finance Division of NIE, now disbanded, first saw the potential for research on competence to address productivity issues in education. The future of further research on competence as a program within NIE is uncertain at present due to changes in management positions within the agency. Nevertheless, interest to date in improving assessment techniques has been strongest among federal education agencies wrestling with problems of providing leadership to upgrade the competence of the teaching force and the effectiveness of schools. Of all agencies providing public service, the schools have had the heaviest accountability demands placed upon them. Moreover, "program evaluation" emerged as an occupation in connection with sponsored educational demonstrations.

As Chapter 4 discusses, interest in competence, especially competence of teachers, runs high. However, the approaches to the study of effective teaching sponsored by the federal government have thus far focused upon a narrow range of cognitive learning outcomes. The pay-off is in identifying some effective techniques teaching that work; but what enables teachers to know when and how to apply these techniques remains unexplored. To be sure, something of value has been learned about effective teaching techniques, but little has been learned about teacher competence.

The Government as Sponsor of Research: Implications

The possibility exists for greater coordination among federal agencies of research and development relating to improving practice in defining and measuring competence and in designing competency-based education and training programs. Consolidating learning from prior efforts of various agencies would represent a good beginning. Also, sponsoring demonstration projects that cross-cut agency mandates is a particularly important consideration, since action in any one of the parts of the human resource development system produces effects throughout the system and because deficiencies in the state of practice are not so much the result of gaps in the state of the art as they are of ignorance of the state of the art and potential benefits from its application.

The Research and Development Community

Interests

The research and development community, comprised largely of individuals within universities and branches of the federal government, is interested in improving the state of the art in psychometric practice, per se, which usually has little to do with the practicalities of application. However, there are interests in applied research, and activity commensurate with this interest is proportional to the amount of funds available for support.

Practice

Chapter 1 on employment selection covers the efforts of the research and development community in greater depth. However, as noted in the same chapter, the impact of the research community, paradoxically, is seldom felt in the employment community. Those organizations which are applying advanced assessment techniques tend to be companies high on the "Fortune 500" list whose financial position and sophistication has enabled them to carry out and apply competency research for their own consumption. For the rest of the employers, there is little noticeable impact of competency research on selection practices. By contrast, as Chapter 4 discusses, there is enthusiastic support for applied research on competence among CBE practitioners. Experiments and program implementations are preceding research, however, and only a few programs are struggling to conduct research in the hectic course of creating new programs. New ground is being broken, often by individuals who lack specialized training in psychometrics or cognitive psychology. The conservative situation of the federal government and private employers is turned on its head, with almost all energies and funds in CBE concentrated on innovation, and practically none devoted to research to inform such innovation. There is also little documentation of either the problems related to conducting research of this kind in operational field settings or on whatever breakthroughs are obtained by doing so.

Rather than providing leadership and guidance to educators, the research and development community seems to be trailing them. The idea of assessment centers is one of the few areas in which the arrow of direction has been from researchers to industry to CBE practitioners. Unfortunately, in our research for Chapter 3 on assessment centers, we were unable to find documentation of educational applications that would permit an in-depth study. One CBE institution currently undertaking concurrent validation studies of its assessments has put considerable effort into advancing assessment center practice by providing training to assessors, developing highly specific criteria for assessing performance of students, and working to ensure inter-rater reliability; this thoroughness is to be applauded and encouraged among others.

Implications

Activities in the research and development community relating to the definition and measurement of competence are disorganized, and community membership is in flux. This is perhaps a healthy condition, since it ensures the re-examination of issues, the continued challenge of traditional practice, and holds the promise of new breakthroughs. However, this same condition prevents the research and development community from having its voice heard as a strong force for change (with the possible exception of the issuance of the standards of assessment published by the American Psychological Association). The

current level of effort is negligible in comparison to the need to apply state of the art techniques. Increasing the rate of progress in educational and employment settings requires more widespread concentration on improving practice.

IV. BLOCKS TO SYSTEM INTEGRATION

The Lack of a Systems Perspective

As we have examined the key interests, practices, and implications for each of the key actors in the human resource development system, the link between education and work emerges as of paramount importance. The overall efficiency of the system, which is dependent on the nature of this link, has implications for both productivity of labor and equal access to education and job opportunities. Productivity and equity are both measures of the efficiency of human resource allocation; thus, they are in reality compatible goals, though in practice they are usually not considered to be so.

The effects of new concerns for equity on the system, spearheaded by Title VII, have been felt most immediately and forcefully in the employment community. Recent court decisions have been accompanied by a decrease in the use of skill and ability tests, personality tests, and educational background requirements, while employers have turned toward increasing use of interviews for screening applicants and documentation of affirmative action initiatives.

The skill and ability tests that are still in use in many settings as indicators of competence are largely respondent, paper-and-pencil tests that tap a very narrow range of abilities, while the use of educational background requirements has

biased the entire employment system against groups of last entry or access to the various credential levels of the education system. The use of academic-type tests further disadvantages these minority groups relative to others, since minorities have had less coaching and practice at test-taking. Diminished use of educational credentials and academic-type tests loosens slightly the tight connection that has grown between success in schools and access to jobs. This, in turn, should show up as a slight gain in distribution of opportunities to minorities, unless other biases are operating given changing practices.

But is the system more efficient as a result of these changes? We cannot really be sure. All other things being equal, a trend toward fairer selections practice, at the expense of predictive rigor, leaves the system worse off in matching appropriately prepared individuals to jobs. We found much activity in documenting selection decisions but very little competency validation to balance it off, so that, rather than selection processes having been improved, they may have become more arbitrary as informal screening interviews have supplanted other, more reliable and valid assessments.

Productivity is the opposite side of the coin. Again, however, we find the employment community primarily interested in productivity for profit, growth and often survival. But while the requirements of the employment system are for a heterogeneous array of talents and skills, the employment system screens to a large extent on the basis of a fairly

limited set of largely intellectual talents and skills--those necessary for academic achievement. Educational institutions, as the suppliers of human resources, are the training and development arm of the human resource system. Yet they are, in general, not well connected with respect to the needs of employers. Most educators tend to teach what they want to teach and measure what they want to measure: a narrow range of cognitive ability and knowledge accumulation. The development of interpersonal skills is almost always accidental rather than intentional. Employers are therefore pressed into spending more dollars in education and training after selection than all the colleges and universities put together, as they cannot depend on educational certification or their own screening procedures for competence in new hires. The human resource development system is not efficient, therefore, in terms of the goals of employers to identify and promote the heterogeneous array of talents and skills needed for growth and increased productivity.

In terms of the interaction of licensing and certifying bodies with the education and employment systems, to be allowed to sit for licensing or certification exams, over the decades, has increasingly become contingent upon an applicant's having met certain educational requirements. Alternate routes to licensure have been closed off. The tests used for licensing and certification are also academic-type tests which tap a very narrow range of knowledge and skills. Moreover, the impact on less credentialed groups, groups less practiced at taking such

tests, is no less serious than similar employment selection practices.

The licensing system is, in fact, one of the strongest conservative forces in society prevailing against efforts to innovate in various sectors of the human resource development system. As Chapter 3 reports, requirements have not been deduced from an understanding of competence in various work roles; the exams are, more often than not, poorly constructed, rarely content-validated, and never subjected to concurrent or predictive validation. Yet, postsecondary occupational and professional programs in domains covered by licensing must teach to these tests or risk the consequences of having their students fail them.

To illustrate some of the problems with the human resource development system working at cross-purposes, consider the case of the Health Services Mobility Study (Guillon & Gilpatrick, 1973), designed to address acute labor shortages in health fields. The purpose of the project was to analyze the tasks performed by medical personnel in radiology, nuclear medicine and ultrasonics to determine specific knowledge and skill requirements. Career ladders were constructed in these job categories based upon similarities and differences in various tasks in particular areas, jobs being delineated or defined and created on the basis of areas of expertise and skill required and their progressive order of difficulty. The data were used to develop curriculum guidelines for educational institutions

and guidelines to be used in the construction of educational paths to parallel career ladders on the job. The idea was that it should be possible for people to have access to continuing or recurrent education which enables them to progress along career ladders or to transfer into other health occupations with overlapping knowledge and skill requirements. Scarce resources of health educational facilities and personnel would not be wasted in redundant training. Students would not need to sit through courses, the content of which had already been mastered. Job mobility would be increased and worker alienation decreased.

The conceptualizing of the research project and its potential were outstanding. However, the licensing structure was out of phase in all states with the proposed career ladders. That gave hospitals pause. They hesitated to allow people to perform work beyond the level at which they were licensed. In fact, to do so would have been illegal. From the perspective of educational institutions, the entire incentive structure conspired against utilizing the HSMS materials to create educational programs parallel to career ladders. First, there was no incentive to create programs to reflect non-existent career ladders. Second, there would be great risk to students, even if the career ladders did exist, since the licensing examinations and prerequisites were out of phase with the proposed ideas. Third, there were no declining enrollments in these areas to encourage innovation. With regard to movement on the part of state licensing agencies, why should they bother with

such a tedious and politically delicate task in the absence of strong pressures for change? And finally, to provide a touch of irony, how could licensing practices be adjusted to be consistent with a program that, due to the other factors, did not even exist?

Educators, licensing and certifying bodies, and employers all have their own notions about what competence is, how it is to be acquired, and how it is to be measured. All have strong self-interests driven by their own constituencies. To use our earlier discussion of validity, the outcome performance criterion is identified as best fits the interests and traditional practice of the group: for most educators, the criteria are grades or scores on achievement or certification examinations; for most licensing and certifying bodies the criterion is performance on a test derived in an armchair-theoretic mode; for most employers, the criterion is supervisory ratings of job performance. If efficiency of the human resource development system is to be a viable goal, including considerations of equity and productivity, the performance criteria must be one that relates to the goals of more than one interested actor in the system. If these interest groups are really part of a system, then the criterion should be a system criterion, not an institutional one.

For the primary human resource development agents in the system, occupational competence must be defined as relating to the productivity of labor. If educators are saying that they

are educating people to be more articulate, to know about Western civilization, and to develop a set of values, then that is their own goal; unless these goals are shown to relate to productivity of labor, these goals should not be claimed to reflect occupational competence. If licensing and certifying bodies say that passing a test of knowledge is their objective in assessment, so be it; but they should recognize that there is much more to occupational competence than this. If employers say that their selection systems predict training success or supervisors' predictions of individual potential, we can argue the merits of these practices for the good of the employer; but we should be clear that neither criterion is equivalent to actual job performance. The practice of competence assessment is guided by institutional goals, and those goals need to be clarified so that they can be examined for both productivity and equity considerations.

The federal government, in its various roles, is also part of the problem. There is much miscommunication between the courts and the employers. As we have found, understanding the content of a court decision regarding assessment is more crucial than simply knowing the outcome of the decision. Employers are receiving the message that paper-and-pencil tests are not likely to be upheld in court, while the courts have ruled against the use of such tests only in cases where actual adverse impact has resulted from their use and they were not judged to be related to performance. The EEOC, meanwhile, has not

clarified its position sufficiently in this regard, and inconsistencies between the Uniform Guidelines and the EEOC's record of enforcement make this commission appear to be carrying out an inquisition. The result is that many employers feel anxious about using any system of selection that may provide documented evidence against them. From a systems perspective, one of the worst things that the EEOC could do is dictate how selection processes are to be carried out and what competencies shall be selected for, rather than limit its examination to the fairness of the outcomes of selection processes. A system driven only by equity considerations will not improve productivity except by chance.

Finally, the research and development community has a role to play, particularly in identifying appropriate measures of productivity of labor and the competencies which relate to productivity for a wide spectrum of critical jobs. As research on assessment is driven by the policies of the founding institutions, the key agent becomes, once again, the federal government. Left to their own devices, research and development groups will advance the state of the art but will have little corresponding impact on the real-world practice of assessment. Current research efforts are highly fragmented; sociologists, psychologists, economists, and philosophers are all looking at different aspects of the problem and they seldom talk to each other. Again, moving the goal outside the interest group so that it becomes a system goal is the way to get the system working more efficiently.

However goals for the human resource development system are stated, they must all respond to the self-interests of the actors in the system for any efficiency gains to occur. Simply stating national productivity as a goal, for example, does not establish a mechanism for rewarding those who take steps to pursue this goal from their own vantage points. "Blue-ribbon" commissions appointed to study problems such as productivity typically meet, deliberate, issue a lengthy report, and disband, never to be heard from again. There is no continuity to action, and no accountability. As we will discuss later, there are things that the government can do to forge an "integration," but there are also areas that are better kept to the actors in the system to sort out for themselves. The federal government could state the goals, provide the mechanisms, and evaluate the results of their attempts, while the actors themselves could determine the process by which those goals are best pursued.

Assessment, Power, and Legitimacy

For each actor in the human resource development system, a significant gap exists between current practice and ideal practice in occupational assessment. To some extent, the conclusions thus far suggest that given better coordination among the actors in the human resource development system, dissemination of information regarding the best of practice, and appropriate support from the government, more efficient and effective

assessment should result. However, there is an aspect of the competence assessment process which may well militate against such a result. That is, the assessment process includes elements of a power relationship between assessor and assessee which are infrequently acknowledged. Therefore, the assessment process, as well as assessment organizations, must provide a basis for legitimizing this power relationship.

Social scientists have long dealt with the concepts of power and legitimacy in discussing the relationships of actors in a social system. The concept of legitimacy is often invoked to explain the reasons which actors in a social system offer as the basis for accepting the exercise of power in a system. Thus, the concept of legitimacy encompasses such issues as who has the right to make certain kinds of decisions, what is a reasonable format for the implementation of a decision, or what constitutes reasonable grounds for the acceptance of a decision by both the decision-maker and those persons affected by the decision. In effect, legitimacy describes the rights and obligations of two parties to a power relationship.

From this perspective, one can view the act of assessment as involving a fairly substantial power relationship between those individuals who have the right to make decisions regarding the competence of other individuals who, in turn, must accept these decisions for some reason. The basis for these reasons--that is, the basis of legitimacy--is a key component to understanding the dynamics of the current state of practice as well as the

inertia we have described as present in the human resource development system.

For example, one critical function of assessment is to systematically control access to employment and training opportunities. Each actor in the human resource development system, having interests of its own, defines what selection criteria are appropriate. The government demands that these criteria should be based on some notion of equity; the educational community and licensing/certifying agencies believe that such criteria should be based on the possession of some body of appropriate knowledge; and employers, of course, emphasize the need for criteria which relate to some sort of bottom-line performance (although, one often wonders about the degree of real commitment to this criterion). In effect, these groups are defining the standards by which people are judged to be competent and the processes by which these competency judgments should be accepted as legitimate. Needless to say, they are also conceptually (as well as operationally) defining the concept of competency. In addition, the research community suggests that, whatever the definion of the standard, or the process of the assessment <u>per se</u>, the resultant data ought to show measurable validity. Therefore, <u>controlling access to opportunities in accordance with some form of criteria and some form of accepted process might be viewed as the manifest function of assessment</u>.

However, the concept of legitimacy enables us to view the assessment process in terms of more latent functions. That is to say, in order for the results of assessment to be accepted as legitimate, the process must appear to others in the organization as being rational or something they can live with and accept. This is, in essence, the notion of legitimacy as an aspect of the power relationship of actors in the social system. For example, educators can agree on the content of the curriculum and the use of grades as an acceptable means of awarding a credential. Licensing and certifying agencies can agree to the use of some form of test. Employers can use supervisory ratings as an acceptable measure of individual performance for promotion or selection. That few of these indicators are strongly related to overall competence in life and work is really beside the point. For whatever reasons, these indicators possess legitimacy in most systems. Thus, such indicators become the norms for assessment as distinguished from the standards of assessment. Standards connote an aspect of quality; norms connote accepted practice, and are much more related to issues of legitimacy and power.

The concept of legitimacy helps explain why the face validity of an assessment process has such a strong effect on the state of practice. A method that has the appearance of reasonableness, no matter what evidence can be martialed against its efficacy regarding standards or validation quality, will tend to become highly utilized. In essence, the actors in the

human resource development system are raising different potential bases for legitimizing the assessment process. These bases for legitimacy emerge from very different paradigms regarding how decisions ought to be made and what kinds of data should be used. For example, it seems apparent that having more knowledge means that an individual must be more competent. It is also seemingly obvious that a supervisor's predictions of an individuals's potential should be significant; after all, who is in a better position to judge an employee than his or her immediate supervisor? The fact that both of these conclusions can be empirically shown to be substantially wrong does not tend to be convincing evidence to organizations that these indicators are not legitimate. Furthermore, one would be hard-pressed to implement indicators that appear less legitimate, even though they may be more empirically valid.

In short, there are any number of bases for legitimizing the assessment process. With respect to the current state of practice, these bases are often derived from a pardigm of tradition, i.e., past practice. Another basis is clearly the image, if not the reality, of a degree of rationality and "objectivity" involved in the judgmental process. The government, on the other hand, raises fairness of assessment processes as a primary base for legitimacy. The research community suggests that legitimacy of assessment decisions be based on various forms of content and predictive validity, i.e., empirical or experimental data. The basic point is that each of these paradigms is, to

some extent, exclusive of the others. Discussions across paradigms often fail to bear fruit simply because the actors accepting the appropriateness of one legitimacy framework can literally have a very difficult time seeing the world in such contrasting terms.

The popularity of assessment center approaches to assessment is a case in point. Whether used for candidate selection, career counseling, skill development, or assessment of potential, the assessment center is typically built on some very powerful bases of legitimacy. For example, panels of "experts" are gathered to define the dimensions which they believe are important to job performance. Exercises are designed to simulate real job settings. Assessors are drawn from the ranks of present organizational managers who typically make selection decisions anyway. And the attainment of the final, overall performance rating is done through a process of debate, give-and-take, and compromise involving multiple sources of information and data. The result is a process which captures many pre-existing normative assumptions about performance and also includes direct contact with many powerful individuals in the organization. It should be no surprise, then, that the most consistent and significant correlation of assessment center ratings is with the supervisor's predictions of future performance. Correlations between assessment center ratings and either supervisor ratings or harder measures of actual performance following promotion are significantly lower. But few organizations seem particularly disturbed by this!

This process, like so many other current assessment practices, is highly face valid. Indeed, why bother to validate a system that is obviously helping people make the right decisions? The deck is really stacked against anyone who suggests a validation study be conducted to examine an accepted and well-established practice. If the results support the present approach, the study will be perceived as a waste of money to confirm the obvious. If the results show no benefit of a new practice over an older method, then the traditional practice will likely be continued. However, if the results suggest that the accepted procedures are either not effective or yield unintended negative consequences (like adverse impact on protected groups or inverse relationships with job performance), most organizations, if such findings threatened legitimacy, would be inclined to suppress the findings of the study or even to fire the authors of the findings, just as in older times messengers bearing bad news lost their heads. Is it any wonder, then, that outside of the university- or government-based research and development community, so few concurrent or predictive validation studies are conducted?

The appearance of validity is as important to the government as it is to employers. The law, through the Congress, the courts, and the enforcement power of the EEOC, constitutes an important determinant of legitimacy for the assessment process. By having moved some employers from face validity to content validity as a standard, the courts have helped to change

practice toward a very different, more empirically-related basis of legitimacy. But this change has only come about as equity has emerged as a critical issue and, therefore, as a competing basis for legitimacy. However, establishing legitimacy through legislation bypasses the process of social contracting by common consensus, and therein lies the major problem for the acceptance
of bases of legitimacy defined by the government. Thus, there is at present little motivation to change existing practice toward some of the more empirically-related bases of legitimacy, since this would threaten many of the traditional bases of legitimacy. In addition, few external incentives exist to make that course of action more attractive.

In conclusion, how can the efficiency of the human resource development system be improved, while recognizing the impact of the legitimacy issue? One suggestion is to encourage employers, federal and state agencies, educators, and licensing/certifying bodies/agencies to share the best aspects of the current practice. This would undoubtedly make others aware, at least, of advancements in assessment practice that are possible. However, we predict that such initiatives would have only a limited effect, due to the differences in paradigms driven by the legitimacy issue. This is also known in business circles as the "not-invented-here" syndrome. Resistance to change will accompany any improvement directed or imposed from the outside, particularly when such changes or improvements are based on a fundamentally different set of bases for legtimizing the assessment process.

The only changes in assessment practices that are likely to occur within organizations are those changes that are clearly seen as enhancing self-interests. Higher education is a good example. For many colleges, the turn toward competency-based education was occasioned not by new levels of standards and accountability so much as the need to survive, though these issues, in many cases, surfaced later. The majority of educators do not see themselves as the developers of the labor force or as the personnel department for the human resource development system. Education is valued on its intrinsic merits. But faced with declining enrollments and the higher costs associated with running an institution, educators have turned toward technical training, continuing education, and competency-based education as strategies for survival. There is otherwise no compelling push from within the education community to be involved in anything other than discipline-focused knowledge.

Meanwhile, students and employers ponder the lack of meaning in the education credential, and wonder whether the movement to competency-based education will change this state of affairs. For those institutions which have, indeed, striven for standards and accountability, there is hope that the diploma will signify something substantially more meaningful.

For many of the actors in the system, there are few similar pressures which will interact with self-interests and thereby alter the efficiency of the human resource development system. However, many employers are presently experiencing a crisis in

planning for and utilizing their own human resources, particularly in light of the strategic needs of their businesses. As a consequence, many larger organizations are beginning to turn toward competency-based selection, performance appraisal, training, and career development systems. It is most probable that future advances in the state of the practice will emerge from these settings. It is certainly conceivable that the government could intervene to augment both the speed and quality of these innovations.

What is lacking is sufficient momentum in the system itself to break the set of current practice. The climate for change, as suggested above, exists in the economic conditions that confront us today. But the barriers to change, as evident in the lack of connections between the actors in the system and the contrasting bases of legitimacy which they employ, work to keep any momemtum below the critical point needed for system change. The section that follows, however, provides some insight into how the actors can take steps to improve practice, with an emphasis on the critical role of federal policy as a catalyst for change.

V. RECOMMENDATIONS FOR IMPROVING THE STATE OF PRACTICE

The federal government is the only actor in the human resource development system whose influence significantly affects competence assessment practice in all other components of the system. It is fitting, therefore, that we conclud. with a discussion of what government agencies can do to overcome the inertia of current practice. We can characterize the steps that can be taken in federal circles as a series of five "action levers," summarized in Table 1, which may be used with other actors in the human resource development system: (1) economic incentives; (2) law and regulation; (3) dissemination (education and advocacy); (4) government practice; and (5) program evaluation. What follows is a discussion of alternatives NIE and other agencies of the federal government have for improving the quality and extent of competence-based education, licensing and certification, and employment selection.

Economic Incentives

Foundations and government agencies can influence competency-based research and practice through direct funding of educational institutions, professional and certifying bodies, and research and development efforts. By focusing on competence outcomes as criteria for developing requests for proposals and

TABLE 1: Government Action Levers for Promoting Competence-Based (CB) Practices

ACTOR	ECONOMIC INCENTIVES	LAW AND REGULATION	DISSEMINATION (EDUCATION AND ADVOCACY)	GOVERNMENT PRACTICE	PROGRAM EVALUATION
GENERAL PRINCIPLE	Give funding priority to, require in RFPs, and use as selection criteria CB concepts	Mandate CB; support legal attacks on non-CB practices; pass funding laws to support CB practice	Disseminate CB concepts; provide "how to" technical assistance; support advocacy for CB against non-CB practice	Implement "model" CB personnel systems: civil service selection, training	Fund construct, concurrent, and predictive validity studies
CONSUMERS	• Preference for CB programs in student loan, GI Bill, tuition fellowships • Tax credits for CB education		• "Consumers Guide" to education institutions stressing CB practice as criteria for choosing a school	• Use CB selection procedures (e.g., service tests)	
EDUCATION TRADITIONAL & NON-TRADITIONAL	• Give funding preference to CB institutions • Fund CB demo projects	• Pass funding laws to support CB institutions, projects	• Public info. releases • Direct mail of "how to" guidelines on CB • Publications on CB (ERIC) • Conferences on CB • Teacher training, followships on CB • Internal training for DED, DOL, DOC, etc. personnel • Technical assistance, demonstration extension agents	• Use CB selection criteria (e.g., to make decisions on education "suppliers")	• Fund and encourage evaluation using CB predictor and criterion variables in all education outcome studies
PROFESSIONAL & CERTIFYING AGENCIES	• Fund reform of licensing	• Publish "model" CB licensing laws • Support legal attacks on non-CB practices	• Disseminate CB guidelines to all state licensing and professional certifying groups • Support advocacy for CB, against non-CB practice	• Accept/require only CB certification in government hiring	• Fund and encourage employer participation in education--occupational performance outcome studies
EMPLOYERS	• Tax credits for investment in CB personnel systems: assessment, selection, training	• Modify EEO, antidiscrimination, fair labor practices, manpower training (eg., ESP, CETA) laws to stress CB in selection, training, advancement	• Disseminate "how to" guidelines on CB practices • Fund demo projects	• Provide technical assistance through Commerce, SBA, DOL, etc.	
RESEARCH & DEVELOPMENT	• Support CB research -- identification -- measurement -- longitudinal studies of occupational and productivity outcomes		• Publish CB research (ERIC) • Conferences	• Sponsor CB R&D on government jobs	• Fund and encourage pre-post and longitudinal impacts of CB practices on occupational outcomes • Evaluate government personnel systems on CB criteria

evaluating grant and contract applications, research and practice can be encouraged to link competency measures to performance results of importance for the human resource development system. Such research efforts might include criterion variable analysis, competency identification and measurement, and related longitudinal studies of occupational and productivity outcomes. Education programs can receive preferential support to the extent that they propose making the attempt to link curricula and assessment with the requirements of the workplace in critical skill areas. Agency budget allocations can also be directed toward demonstration and service projects which meet standards for good competency-based practice. At the consumer end, the government can influence choices of education and training programs by making more dollars available in the form of low-cost tuition loans, tuition vouchers, fellowships, and other education reimbursements (e.g., G.I. Bill benefits) for enrolling in programs that respond to national manpower needs. Indeed, redistributing student demand by means of such incentives will create greater pressure for educational program re-examination. Finally, at the state and federal level, funds can be made available for research into licensing and certification requirements, provided that this research is coordinated with other action levers such as law and regulation and with due regard to states' rights.

Tax credits are another form of economic incentive, usually reserved for capital investment in equipment. Currently,

employer expenses in personnel selection and training are treated as deductible business expenses for tax purposes. It should therefore be possible to offer investment tax credits to employers for the design and validation of selection systems and training programs, on the premise that the government should encourage investments in human resources which lead to increased productivity on the same basis as it encourages "equipment" capital investment. This approach of providing rewards for validation holds greater promise as a way to improve the state of employment selection practice than negative incentives in the form of threats from the EEOC which have led mainly to retreats from the best of practice. Similarly, tax deductions for individuals could be made more attractive for participation in education that enhances employability in jobs that respond to national needs and which can be demonstrated empirically as efficacious in improving performance on one's current job. This proposal is almost identical in language and in intent to that of current tax law, which allows individual deductions for expenses related to education required to improve job performance.

Law and Regulation

There are a number of ways in which the government can influence the key change agents in the human resource development system through law and regulation. Special funding set-asides

for developing competency-based, innovative programs in education can be mandated, and program accreditation can be based on the contributions of program graduates to society (determined, for example, by a "social audit" of graduates' accomplishments), rather than on such criteria as curriculum content and physical facilities. Licensing and certifying groups are among the most susceptible to challenge in the courts regarding fair practices, and it is only a matter of time before the validity of licensing and certification examinations are called into question. The process of conversion to competency-based systems could be hastened by publishing model licensing laws that require accountability, and by supporting attacks in the courts against credentialing practices that have not been suitably validated against real job requirements.

The increased sophistication of the courts in dealing with issues of the validity of selection practices could conceivably lead to the requirement that fair practices be not only fair but also be statistically related to performance outcomes. The implementation of EEO guidelines should be carefully examined to see if the ability to do good work on the job is adequately taken into account along with considerations of equity. Indeed, in deciding which cases to pursue, the EEOC should pay attention to an employer's desire to improve workforce productivity in the absence of prior evidence of discrimination, when applying the "four-fifths" rule.

Dissemination

The federal education establishment has long sponsored a variety of dissemination approaches to spread educational innovations. Educators could be reached through almost all of the dissemination mechanisms: Department of Education information releases, direct mail, conferences (e.g., Institute of Educational Leadership programs), ERIC publications, internal training of personnel in the Department of Education, Department of Labor and other federal agencies who influence education practice, demonstration and extension efforts (e.g., FIPSE projects), fellowship programs, teacher training and technical assistance.

Consumers can become acquainted with CBE concepts via public relations releases, articles in the popular press and funding of public interest or advocacy groups. The Department of Education could publish a "consumer guide" to educational institutions which stresses consumer evaluation of competency-based education, criterion-referenced to occupational outcomes when choosing a school. It is likely, however, that consumers will learn of CBE primarily through the advertisements and selfdescriptions of service providers, such as innovative educational institutions which seek to differentiate themselves by offering "competency-based" curricula or employers who use competency-based selection and training programs.

Licensing boards and certifying organizations could be contacted by direct-mail brochures or guidelines explaining

competence-based practices and how to implement them, conferences, ERIC publications, and extension agents; and they could be indirectly influenced through support of public interest/ advocacy group attacks on non-competency based licensing tests and standards.

Finally, employers could be directly reached by publicizing the cost benefit results of competency-based selection and training programs via press releases (perhaps in cooperation with the U.S. Office of Personnel Management, the Department of Commerce, the National Productivity Counsel, etc.), direct mail brochures, publications, conferences, and demonstrations and extension efforts (especially those which involve consortia of education, private sector employer, and research and development organizations). The target audience here would be the many employers who lack the sophistication or the internal capability to conduct unassisted validation of selection and training efforts. Simply publishing a "how-to-do-it" guide, stressing common sense approaches to making fair, job-related selection decisions might remove some of the fear and anxiety expressed by many employers about undertaking the rigors of justifying or changing selection practices. In fact, the EEOC could provide this information through a technical assistance function, which would help to build its image as a positive force in helping employers improve their selection practices while complying with federal guidelines.

Government Practice

Because of its visibility and the percentage of the labor force it employs, the federal government can exert great influence simply by "modeling" or demonstrating the concepts and methods it seeks to advance. Affirmative action programs and advanced project management methods developed by the military (e.g., PERT programming) offer two examples of government practices widely adopted by non-governmental organizations.

The federal government, through its many service tests, has a unique opportunity to model, on a large scale, selection procedures that reflect the best of practice and to examine the concurrent and predictive validity of the myriad of multiple-choice tests in use by the military and civil service offices. To some extent this is occurring within OPM, the Army and the Navy, and model projects are being put forward to demonstrate the efficacy of selection based on competence. For those government jobs that currently require certification, pressure can be mounted toward requiring, eventually, that competence-based certification be a prerequisite for government hiring, by establishing performance standards in lieu of requiring certificates.

The government also is both a large source and a large user of education and training programs. Educational programs developed within agencies could be re-examined to see if they are living up to their claims of being related to competence in the technical, professional, and administrative jobs for which they

train. As a purchaser of education programs from universities and other outside suppliers, the government can demand that the educational validity and utility of the offered programs be documented, in accordance with established competence-based evaluation specifications. This should encourage further accountability on the part of suppliers of educational services and have benefits for other purchasers as well.

Modeling of research practice can have additional effects for employers, particularly if the modeling is in the form of technical assistance provided through such agencies as the Small Business Administration, the Department of Commerce, and the Department of Labor. Employers should be able to apply for these services where competence-based applications and practices have been documented for dissemination by federal agencies. Also, to the extent to which competence research on critical government jobs has been documented to serve as further examples for employers that "it can be done," direct "hands-on" assistance also should be considered part of a dissemination strategy.

Program Evaluation

Most program evaluation sponsored by federal and state government agencies focuses upon education programs in schools. In all cases, we encourage evaluation that equally examines the outcomes and the processes of programs in work settings as well as schools. This will mean increasing emphasis on longitudinal,

concurrent and predictive validity studies. Cost-benefit analyses, where possible, should also be encouraged and funded. Cooperative ventures involving educators and employers together provide an excellent opportunity to look at the education and work interface, and evaluation of these programs would be useful in encouraging similar efforts.

Perhaps most important, in support of helping the government develop a coherent interagency and interprogram policy for supporting competence-based practice by all actors in the human resource development system, the Department of Education should take the lead in aggregating interagency research, development, and evaluation studies on competence-based practices and the functioning of the human resource development system as a whole. This effort should identify specific problems, targets of opportunity, and further action levers for the development of broader policy.

Conclusion

In our study of the practice of competence assessment, we have concluded that, for a variety of reasons, the state of practice has not moved very close to an ideal, nor is the research and development community the most likely actor to influence change in this regard. As consumers of the products of the human resource development system, employers are the actors that are driving the majority of advances in selection and education practice, while conflicting interests in the rest

of the system as well as within the employment community itself prevent the state of the practice from advancing very far. Employers, however, have become the major educators and trainers in the system. They are closest to the jobs to be performed and find many new employees lacking adequate preparation. Educational institutions and licensing and certifying bodies have been slow to respond to the needs of the workplace. As economic constraints and the shift of education from the academny to the workplace continue, a response from other actors in the human resource development system will surely come. But the response might not come soon enough to meet national productivity needs.

The inertia in the human resource development system is enormous: each of the actors has its own interests, which are often at cross-puposes with productivity. Government law and regulation have engendered some positive change in the area of more equitable access to education and employment opportunity, but have also had unintended negative consequences for the efficient operation of the system. The framework for the action levers proposed in the previous section is our informed attempt to focus attention on the government as a positive force for change through a number of means already at its disposal. It has become clear to us, however, that strong action needs to be taken to affect all actors in the system together. The actors are interconnected and interdependent to a great extent, not as they perceive their own operation perhaps, but certainly as their work affects the productivity of labor. Thus, no amount

of money or effort spent on education alone is likely to improve productivity in proportion to the initial investment. Education happens in all parts of the system, not just within the academy, so all parts must feel the impact of new initiatives together.

Finally, what is needed is a strong national policy focused on productivity which is directed at improving the efficiency of the human resource development system. Currently, there are no superordinate goals which all the actors in the system can aspire to or feel the need to commit to, given their own self-interests. Policy which exists today is fragmented and not co-ordinated with an integrated set of mechanisms to make changes occur in practice. Policymakers need to examine the weaknesses in the present system and to develop a coherent framework for accountability in which all the actors in the system are evaluated against their contributions to overall productivity of labor.

The concept of competence is exceedingly complex. Most of the writing in the separate chapters has dwelt upon assessing individual competence and the problems with practice in definition and measurement. Our conclusion is that, in order for us to move assuredly toward improving the state of the practice, we must address the issue of national competence from an organizational systems perspective. There are some fundamental "incompetencies" in the way the American human resource development system is functioning, and this chapter has focused on some of the vicissitudes of the system. It is critical to bear in mind that, as we go about attempting to understand what competence

is and how it is measured at the individual level, we take care to attend to applying the same standards of competence to our national priorities and goals and how they are achieved.

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